

(19) 대한민국특허청(KR)

(12) 등록특허공보(B1)

(51) Int. Cl. 6

C08G 65 /48

C08G 65 /34

(11) 등록번호

10-0226442

(24) 등록일자

1999년07월27일

(21) 출원번호

10-1997-0054781

(65) 공개번호

1999-0033424

(22) 출원일자

1997년10월24일

(43) 공개일자

1999년05월15일

(73) 특허권자

한국전기통신공사 이계철

경기도 성남시 분당구 정자동 206한국전자통신연구원 정선중
대전광역시 유성구 가정동 161번지

(72) 발명자

이명현

대전광역시 유성구 어온동 한빛아파트 120동 1306호
한선규

대전광역시 서구 만년동 강변아파트 101동 1003호

이령종

대전광역시 유성구 신성동 한울아파트 106동 404호

안주현

대전광역시 유성구 신성동 한울아파트 102동 102호

원홍현

대전광역시 유성구 신성동 한울아파트 102동 102호

김명설, 이화의

(74) 대리인

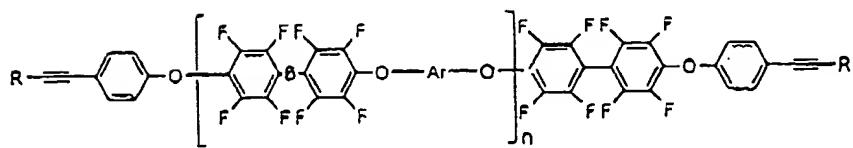
심사관 : 김홍균

(54) 열 경화성 에티닐기를 갖는 불소 치환 폴리아릴렌 에테르, 그의제조방법 및 그를 이용한 광소자

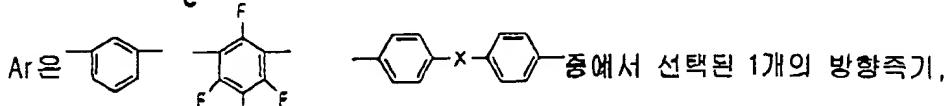
(57) 청구의 범위

청구항 1. 하기 화학식 (1)로 표시되는 에티닐기를 갖는 불소 치환 폴리아릴렌에테르:

(화학식 1)



식 중, B는 없거나, C^{O} 또는 SO_2 이고 R은 H 혹은 페닐기,



X는 $-\text{C}(\text{CF}_3)_2$, $-\text{CO}-$, $-\text{SO}_2-$, $-\text{O}-$, 또는 $-\text{S}-$ 이고,

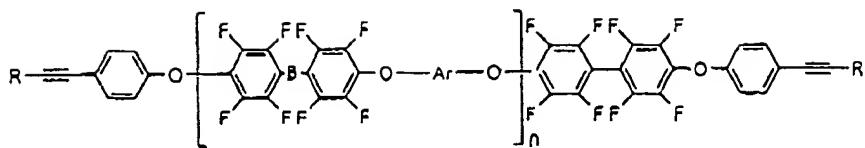
n은 종합도로서 1 ~ 100의 자연수임.

청구항 2. 제 1 항에 있어서,

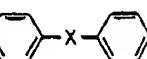
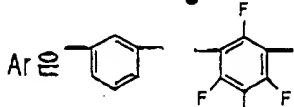
불소 치환 폴리아릴렌 에테르 10-페닐에티닐 폐놀(FPAE10-PEP), 불소 치환 폴리아릴렌 에테르20-페닐에티닐 폐놀(FPAE20-PEP), 또는 불소 치환 폴리아릴렌 에테르40-페닐에티닐 폐놀(FPAE40-PEP)인, 에티닐기를 갖는 불소 치환 폴리아릴렌에테르.

청구항 3. 데카플루오로바이페닐 화합물과 방향족 디올 유도체를 열축종합시켜 말단에 플루오로페닐기가 위치한 폴리아릴렌 에테르를 제조하는 단계와, 상기한 폴리머에 에티닐 폐놀 유도체를 고분자 말단에 치환하는 단계를 포함하는 하기 화학식 (1)로 표시되는 에티닐기를 갖는 불소 치환 폴리아릴렌에테르의 제조방법:

(화학식 1)



식 중, B는 없거나, O^0 또는 SO_2 이고 R은 H 혹은 페닐기,



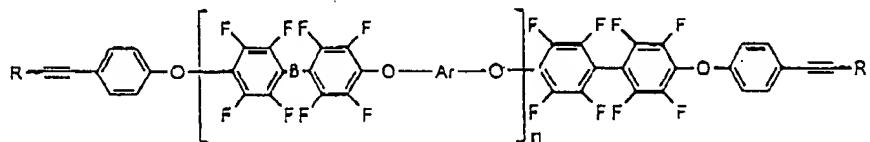
중에서 선택된 1개의 방향족기,

X는 $-\text{C}(\text{CF}_3)_2$, $-\text{CO}-$, $-\text{SO}_2-$, $-\text{O}-$, 또는 $-\text{S}-$ 이고,

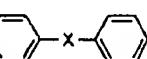
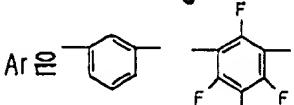
n은 중합도로서 1 ~ 100의 자연수임.

청구항 4. 데카풀루오로벤조페논 화합물과 방향족 디올 유도체를 열축중합시켜 말단에 풀루오로페닐기가 위치한 폴리아릴렌 에테르를 제조하는 단계와, 상기한 폴리머에 에티닐 페닐 유도체를 고분자 말단에 치환하는 단계를 포함하는 하기 화학식 (1)로 표시되는 에티닐기를 갖는 불소 치환 폴리아릴렌에테르의 제조방법:

(화학식 1)



식 중, B는 없거나, O^0 또는 SO_2 이고 R은 H 혹은 페닐기,



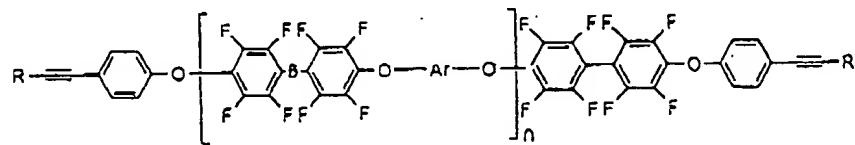
중에서 선택된 1개의 방향족기,

X는 $-\text{C}(\text{CF}_3)_2$, $-\text{CO}-$, $-\text{SO}_2-$, $-\text{O}-$, 또는 $-\text{S}-$ 이고,

n은 중합도로서 1 ~ 100의 자연수임.

청구항 5. 실리콘 기판 상에 형성된 하부 클래딩층과, 상기한 하부 클래딩 상에 형성된 코어층과, 상기한 코어층 상에 형성된 상부 클래딩층을 포함하는 광도파로형 광소자에 있어서, 상기한 코어층이 하기 화학식 (1)로 표시되는 에티닐 기를 갖는 불소 치환 폴리아릴렌 에테르인 것이 특징인 광도파로형 광소자:

(화학식 1)



식 중, B는 없거나, O 또는 SO_2 이고 R은 H 혹은 폐닐기,

Ar은 중에서 선택된 1개의 방향족기,

X는 $-\text{C}(\text{CF}_3)_2$, $-\text{CO}-$, $-\text{SO}_2-$, $-\text{O}-$, 또는 $-\text{S}-$ 이고,

n은 종합도로서 1 ~ 100의 자연수임.

(19) THE KOREAN INDUSTRIAL PROPERTY OFFICE
(12) REGISTERED PATENT OFFICIAL GAZETTE (B1)

(11) REGISTRATION No. 10-0226422
(24) REGISTRATION DATE JULY 27, 1999
(21) APPLICATION No. 10-1997-0054781
(22) APPLICATION DATE OCTOBER 24, 1997
(65) PUBLICATION No. P1999-0033424
(43) PUBLICATION DATE MAY 15, 1999
(73) PATENTEE KOREA TELECOM
PRESIDENT : LEE GE CHEOL
(72) INVENTORS

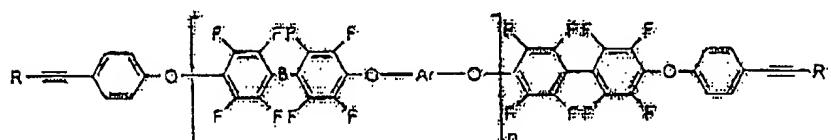
LEE MYUNG HYUN
HAN SEON GYU
LEE HYUNG JONG
AN JU HEON
WON YONG HYUB

(74) AGENTS : KIM MYUNG SEOB, LEE HWA IK

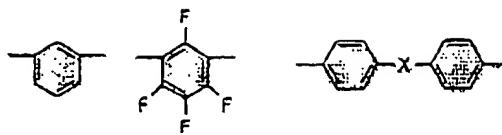
(54) FLUORINE SUBSTITUTED POLYARYLENE ETHER HAVING THEMOSETTING ETHINYL RADICAL, METHOD FABRICATING THE SAME AND OPTICAL DEVICE USING THE SAME

(57) CLAIMS

1. Fluorine substituted polyarylene ether having ethinyl radical, as represented by the following formula (1):



where B is nonexistent, C_6H_4 or SO_2 and R is H or phenyl radical,
Ar is one aromatic radical selected

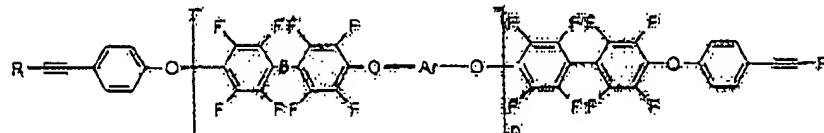


X is $-\text{C}(\text{CF}_3)_2$, $-\text{CO}-$, $-\text{SO}_2$, $-\text{O}-$ or $-\text{S}-$,

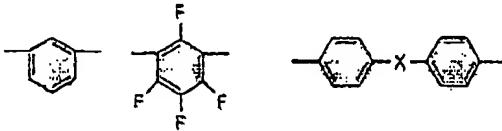
n is natural number ranging from 1~100 as polymerization degree.

2. The fluorine substituted polyarylene ether having ethynyl radical according to claim 1, wherein the fluorine substituted polyarylene ether is fluorine substituted polyarylene ether 10-phenylethynyl phenol(FPAE10), fluorine substituted polyarylene ether 20-phenylethynyl phenol(FPAE20), or fluorine substituted polyarylene ether 40-phenylethynyl phenol(FPAE40).

3. A methoe for fabricating fluorine substituted polyarylene ether having ethynyl radical, as represented by the following formula (1), which comprises steps of thermal polycondensing decafluorobiphenyl compound and aromatic group diol- derivatives to form polyarylene ether in which fluorophenyl radical is disposed at an end thereof, and substituting polymer for ethynyl phenol derivatives at a high molecular end.



where B is nonexistent, C or SO_2 and R is H or phenyl radical,
Ar is one aromatic radical selected from

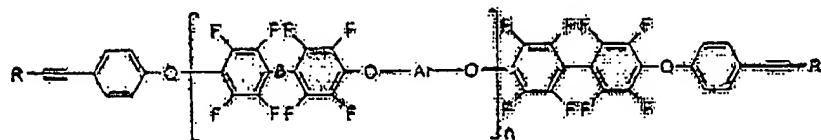


X is $-\text{C}(\text{CF}_3)_2$, $-\text{CO}-$, $-\text{SO}_2$, $-\text{O}-$ or $-\text{S}-$,

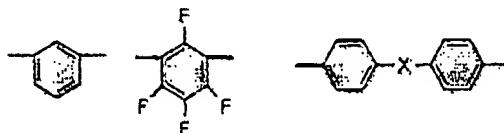
n is natural number ranging from 1~100 as polymerization degree.

4. A methoe for fabricating fluorine substituted polyarylene ether having ethynyl radical, as represented by the following formula (1), which comprises steps of thermal polycondensing decafluorobenzophenone compound and aromatic group diol- derivatives to form polyarylene ether in which fluorophenyl radical is disposed

at an end thereof, and substituting polymer for ethynyl phenol derivatives at a high molecular end.



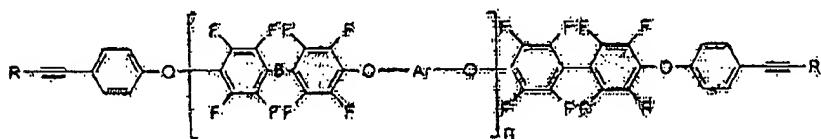
where B is nonexistent, C_6H_4 or SO_2 and R is H or phenyl radical,
Ar is one aromatic radical selected from



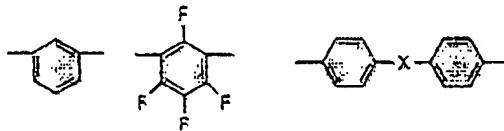
X is $-\text{C}(\text{CF}_3)_2$, $-\text{CO}-$, $-\text{SO}_2$, $-\text{O}-$ or $-\text{S}-$,

n is natural number ranging from 1~100 as polymerization degree.

5. An optical waveguide device comprising a lower cladding layer formed on a silicon substrate, a core layer formed on the lower cladding layer, and an upper cladding layer formed on the core layer, wherein the core layer is made from fluorine substituted polyarylene ether having ethynyl radical, as represented by the following formula (1):



where B is nonexistent, C_6H_4 or SO_2 and R is H or phenyl radical,
Ar is one aromatic radical selected from



X is $-\text{C}(\text{CF}_3)_2$, $-\text{CO}-$, $-\text{SO}_2$, $-\text{O}-$ or $-\text{S}-$,

n is natural number ranging from 1~100 as polymerization degree.